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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HOGAN & HARTSON L.L.P.
500 S. GRAND AVENUE
SUITE 1900
LOS ANGELES, CA 90071-2611

EXAMINER	
NGUYEN, FRANCIS N	

ART UNIT	PAPER NUMBER
2674	29

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/196,013	Applicant(s) KOMA, NORIO	
	Examiner FRANCIS NGUYEN	Art Unit 2674	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5 and 7-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5 and 7-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *27,28* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The amendment filed on 1/21/2003 is entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 9-15, 24-28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. (U.S. Patent 5,920,301) in view of Kuo et al. (US Patent 6,014,194).

As to **claim 1**, Sakamoto et al. discloses a liquid crystal display (column 1 , lines 16-20) having liquid crystal sandwiched between a pair of substrates having electrodes (column 5, lines 40-47) for driving the liquid crystal based on respective R, G , and B signals (R/G/B signals input to memory 57 shown in figure 12) to control transmittance of each of the R , G , and B light components for color display , wherein

each of upper limit values of ranges for driving voltages (+VD shown in figure 5B) respectively for R display , G display, and B display is set independently for R light, G

light, and B light, without control voltage applied to the substrates to control the intensity of R, G, and B light simultaneously, an upper limit value for a range of values usable within an entire duration of display as driving voltages for respective R/G/B light components (Vsat as shown in figure 7). However, Sakamoto et al. fails to teach an upper limit value for at least one of the colors differs from the upper limit values for other colors. Kuo et al. discloses a transmission/voltage characteristic for colors red/green/blue in figure 1 as prior art; note the applied voltage corresponding to highest transmission for color blue is different from that of color green and color red (figure 1). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Sakamoto et al. then apply a driving voltage for color blue, different from that of color green and red, based on the transmission/voltage characteristic disclosed by Kuo et al. to obtain the apparatus Sakamoto et al. modified by Kuo et al. because it would result in color balance and high quality color display.

As to **claim 9**, Sakamoto et al. modified by Kuo et al. teaches each of said upper limit values of ranges for the driving voltages applied to the liquid crystal is set based on the transmittance characteristics of each of R, G, and B light components (Kuo et al, figure 1).

As to **claim 24**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

As to **claim 5**, note the same citations for claim 1. Claim 5 differs from claim 1 only with specific feature of an electrically controlled birefringence liquid crystal display; note that Kuo et al. teaches electrically controlled birefringence LCD (column 1, lines

34-36) and Sakamoto et al. discloses driving circuitry from R/G/B input signals shown in figure 12 .

As to **claim 25**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

As to claim 10, note the same citations for claim 1. Claim 10 differs from claim 1 with specific feature " maximum difference among the set voltages stays within 20%"; note figure 1 of Kuo et al. shows convergence of characteristic curves for colors green and red where applied voltage is above 6.5Volts. Therefore, the difference between applied voltages for colors green and red is within 20% as claimed.

As to **claim 26**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

As to **claim 11**, note the same rejection, citations for claim 1. Claim 11 differs from claim 1 only with specific feature of " which shows non-transmittance to the light when no voltage is applied"; note Kuo et al. figure 1 shows non-transmittance for applied voltage at 0 Volts.

As to **claim 12**, Sakamoto et al. modified by Kuo et al. teaches maximum difference among said set upper limits of ranges of driving voltages applied to the liquid crystal for each of R,G, and B light never exceeds 20% (Kuo et al. figure 1 shows applied voltages within 20%).

As to **claim 27**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

As to **claim 13**, note the same citations for claim 1. Although Claim 13 differs from claim 1 only with specific feature of pixel and opposing electrode ; note Sakamoto et al. teaches pixel electrode and opposing electrode (column 3, lines 42-44) .

As to **claim 14**, Sakamoto et al. modified by Kuo et al. teaches maximum difference among said set upper limits of ranges of driving voltages applied to the liquid crystal for each of R,G, and B light never exceeds 20% (Kuo et al. figure 1 shows applied voltages within 20%).

As to **claim 15**, Sakamoto et al. modified by Kuo et al. teaches maximum light transmittance is defined by said upper limit values of ranges of said driving voltages (see Kuo et al. transmittance versus applied voltage in figure 1)

As to **claim 28**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

As to **claim 18**, note the same citations for claim 1. Although Claim 18 differs from claim 1 only with specific feature of pixel and opposing common electrode ; note Sakamoto et al. teaches pixel electrode and opposing electrode (column 3, lines 42-44).

As to **claim 30**, Sakamoto et al. modified by Kuo et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

Claims 16-17, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. in view of Kuo et al. and further in view of Nakamura et al.(US Patent 5,691,791) .

As to **claim 16**, note the same citations for claim 1. Sakamoto et al. modified by Kuo et al. fails to teach a reflective display, reflection electrode and transparent electrode. Nakamura et al. teaches a reflective liquid crystal display (see Abstract) , a reflection electrode (column 7, lines 52-54), and transparent electrode (column 7, lines 62-65). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Sakamoto et al. modified by Kuo et al. and substitute the LCD display with the reflective display , reflection electrode and transparent electrode as taught by Nakamura et al. to obtain the apparatus Sakamoto et al. modified by Kuo et al. and Nakamura et al. because it would result improve contrast as taught by Nakamura et al. (column 4, lines 14-19) .

As to **claim 17**, Sakamoto et al. modified by Kuo et al. and Nakamura et al. teaches the reflective type liquid crystal display of claim 16, wherein said reflection electrode is a pixel electrode (Nakamura et al. , column 7, lines 53-54) formed individually for each pixel, and each of the upper limit values of ranges for driving voltages of said R,G,

and B driving signals applied to respective pixel electrode is set independently for R, G, and B light (Kuo et al. figure 1).

As to **claim 29**, Sakamoto et al. modified by Kuo et al. and Nakamura et al. teaches at least the upper limit values for R and B light components differ from one another (Kuo et al. figure 1 shows upper value for R light is different from that for B light).

Claims 19- 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. in view of Kuo et al. and further in view of Hirai et al. (US Patent 5,646,643).

As to **claim 19**, Sakamoto et al. in view of Kuo et al. teaches a liquid crystal display comprising:

a display section (Sakamoto et al., LC device shown in figure 16) and a display section driving circuit which supplies a driving voltage signal in accordance with a display content (Sakamoto et al. , data driver 21 shown in figure 12). However, Sakamoto et al. fails to teach a maximum transmittance voltage limiting circuit. Hirai et al. discloses a maximum transmittance voltage limiting circuit (driving voltage supply circuit 719 with voltage dividing circuit 2617, column 27, lines 7-8, column 28, lines 15-17). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the device Sakamoto et al. modified by Kuo et al. then add the maximum transmittance voltage limiting circuit, as taught by Hirai et al. to obtain the device Sakamoto et al. modified by Kuo et al. and Hirai et al. , because it would provide a range of driving voltages including maximum and minimum driving voltages, thus energy is saved as required. This corresponds to the claimed driving voltage signal

having its maximum transmittance voltage limited by said voltage limiting circuit is supplied to a corresponding pixel in said display section.

As to **claim 20**, Sakamoto et al. modified by Kuo et al. and Hirai et al. teaches said display section driving circuit includes a minimum transmittance voltage level for achieving minimum liquid crystal transmittance of said driving voltage signal to a predetermined voltage level greater than 0V by absolute value (Hirai et al. , driving voltage supply circuit 719 supplies minimum transmittance voltage , voltage Vx shown in figure 23 C.

As to **claim 21**, Sakamoto et al. modified by Kuo et al. and Hirai et al. teaches said maximum transmittance voltage levels determined and limited for R and B light components differ from one another (Kuo et al. teaches maximum transmittance voltage levels for R and B are different as shown in Kuo et al. figure 1).

As to **claim 22**, Sakamoto et al. modified by Kuo et al. and Hirai et al. teaches no transmittance characteristic in a state of no voltage application (note Kuo et al. figure 1 shows non-transmittance for applied voltage at 0 Volts).

As to **claim 23**, Sakamoto et al. modified by Kuo et al. and Hirai et al. teaches said maximum transmittance voltage level for B light is limited to a voltage level smaller than said maximum transmittance voltage level for R light by absolute value (Kuo et al. figure 1 shows difference in maximum transmittance for B and R).

Claims 3, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. in view of Kuo et al. and further in view of Sawada (U.S. Patent 6,078,317).

As to **claim 3**, Sakamoto et al. modified by Kuo et al. fails to teach gamma correction. Sawada discloses gamma characteristic adjustment circuit 19(figure 1, column 6, lines 63-65) for LCD display. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Sakamoto et al. modified by Kuo et al. then add a gamma adjustment circuitry, as taught by Sawada, to obtain the combined apparatus Sakamoto et al. modified by Kuo et al. and Sawada , because it would result in proper luminance on LCD display.

As to **claim 7,** Sakamoto et al. modified by Kuo et al. fails to teach gamma correction. Sawada discloses gamma characteristic adjustment circuit 19(figure 1, column 6, lines 63-65) for LCD display. It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus of Sakamoto et al. modified by Kuo et al. then add a gamma adjustment circuitry, as taught by Sawada, to obtain the combined apparatus Sakamoto et al. modified by Kuo et al. and Sawada , because it would result in proper luminance on LCD display.

Claims 4, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al. in view of Kuo et al. and further in view of Miyasaka et al. (U.S. Patent 5,834,827).

As to **claim 4**, Sakamoto et al. modified by Kuo et al. fails to teach poly-Si thin film transistors using a poly-Si layer formed at low temperature. Miyasaka et al. teaches poly-Si thin film transistors using a poly-Si layer formed at low temperature (column

1, lines 51-65, column 2, lines 12-16, column 14, lines 20-36). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Sakamoto et al. modified by Kuo et al. then apply the poly-Si thin film transistors at low temperature as taught by Miyasaka et al. because it would result in high performance TFTs and achieve compact , lightweight liquid crystal display device as taught by Miyasaka et al. (column 14, lines 31-40).

As to **claim 8**, Sakamoto et al. modified by Kuo et al. fails to teach poly-Si thin film transistors using a poly-Si layer formed at low temperature. Miyasaka et al. teaches poly-Si thin film transistors using a poly-Si layer formed at low temperature (column 1, lines 51-65, column 2, lines 12-16, column 14, lines 20-36). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize the apparatus Sakamoto et al. modified by Kuo et al. then apply the poly-Si thin film transistors at low temperature as taught by Miyasaka et al. because it would result in high performance TFTs and achieve compact , lightweight liquid crystal display device as taught by Miyasaka et al. (column 14, lines 31-40).

Response to Arguments

3. Applicant's arguments filed on 1/21/03 have been fully considered but they are not persuasive.

Applicant's argument as to cited art failing to teach a driving circuit, a limiting circuit is not valid because Sakamoto et al. does teach a driving circuit (shown in figure 12), Hirai et al. does teach a limiting circuit (driving voltage supply, column 27, lines 7-8).

Applicant's argument as cited art failing to teach maximum transmittance voltage level is not valid because Kuo et al. does teach maximum transmittance voltage level in figure 1.

CONCLUSION

4. The art made of record but not relied upon is pertinent to Applicant's disclosure

US Patent	Koma	6,304,304
US Patent	Yagyu	6,037,922
US Patent	Akiyama	5,621,479

Reference Koma is made of record as it has the same inventor disclosing the structure of an RGB driver processing circuit comprising limiter circuit.

Reference Yagyua is made of record as it discloses image display system showing a transmission versus voltage curve.

Reference Akiyama is made of record as it discloses a method of driving a liquid crystal device, with the transmittance characteristic of each pixel reaches maximum value.

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **FRANCIS N NGUYEN** whose telephone number is **703 308-8858**. The examiner can normally be reached during hours 8:00 AM- 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **RICHARD A HJERPE** can be reached at 703 305-4709.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service whose telephone number is (703)306-0377.

FRANCIS N NGUYEN
Examiner
Art Unit 2674

FN
November 14th, 2003

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600